

## **Not My Fault: Tsunami alerts and false alarms in the era of Twitter**

Lori Dengler/For the Times-Standard  
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Every morning, I update the Humboldt Earthquake Hot Line (see below) and summarize local, regional and global earthquake activity. Last Monday was a quiet day earthquake wise. The only events that made it onto my recording were two M3s in Southern California. So I was more than a little surprised to see a Facebook post about a tsunami warning in El Salvador.

Most damaging tsunamis are caused by big earthquakes. El Salvador does have a tsunami threat. In 1902, at least 100 lives were lost and in 2012, 15 to 20 foot tsunami heights were observed on the El Salvador coast. Both of these tsunamis were caused by earthquakes in the magnitude 7 range, located close to the El Salvador coast. Very large distant earthquakes in 1952, 1957 and 1960 have also produced tsunamis that were large enough to potentially cause damage in the El Salvador coastal areas.

The largest Central American earthquake last Monday morning had a magnitude of 4.6, way too small to pose a tsunami threat. My first guess was the Facebook post was incorrect. But I was intrigued and did a bit more digging. First I went to the US Tsunami Warning Centers page at <https://www.tsunami.gov/>, to see if any bulletins had been issued. I found nothing of note there.

The tsunami warning system in the Pacific is a little complicated. Some countries like Japan have their own tsunami center and capability to detect earthquakes, analyze water level data and issue warnings. But most countries in the Pacific, including El Salvador, rely primarily on the US Pacific Tsunami warning Center (PTWC) in Hawaii for tsunami-relevant data.

PTWC shares tsunami warning responsibilities with the National Tsunami Warning Center (NTWC). NTWC alerts Alaska, all of the contiguous 48 states, and Canada. PTWC is responsible for Hawaii, US territories in the Pacific and in the Caribbean. PTWC also has an added responsibility. Through an agreement with UNESCO's Intergovernmental Oceanic Commission, it sends messages to the 46 countries in the Pacific that are members of the IOC system.

PTWC detects earthquakes throughout the Pacific, and, if analysis suggests a tsunami with the potential to cause damage, they issue a threat message. PTWC does not have the authority to issue warnings to foreign countries, but the assessment of likely water heights may lead those countries to issue their own warning messages.

I sent an email to a colleague who works at PTWC to see if they knew anything about the El Salvador situation. I also sent a query to the International Tsunami Bulletin Board, an email list of global tsunami scientists. They were all as surprised as I was.

Next I searched Google News and found several articles about the supposed El Salvador tsunami. I've included the link to the most useful one below. I'm always a little leery about using the media as my sole information source. But the main details in this case are fairly clear. It involves tweets and the tweet trail is public. The US Embassy in San Salvador issued a tweet Monday morning that a US Department of Defense airplane had observed a "possible tsunami" about 600 miles off the El Salvador coast. I haven't a clue what led either the pilots or the embassy staff to think they saw a tsunami. That information has not been released.

Whatever they saw, it was very unlikely to be a tsunami. Tsunamis in deep water are only detectable with the most sensitive of deep-water pressure instruments and not from the air. Tsunamis have long wavelengths – tens to hundreds of miles - and don't build up in amplitude until they reach shallow water. I have interviewed fishermen who were only a few miles off the coast when a tsunami occurred. They didn't notice a thing and were shocked to see the destruction when they returned to land.

The San Salvador president Nayib Bukele took the tweet seriously and responded with his own tweet that coastal populations should move to higher ground. It is not clear from the media reports exactly what followed. Some civil authorities declared an emergency but apparently no official evacuations were carried out. Costa Rica and Nicaragua were quick to declare there was no evidence of a tsunami. I've seen reports of "panic" and "confusion" but no details or evidence that anyone was actually hurt.

Our modern tsunami warning system in the Pacific is the result of more than 70 years of development and refinement. It balances the requirement for rapid information with the need for accuracy and avoiding unnecessary alarms. Persons responsible for issuing warnings in member IOC countries receive training and guidance on the science of tsunamis, how the system

works and what to expect when large earthquakes occur. Any organization, including the U.S. embassy, that is not part of the official system won't understand how it works.

They don't have the necessary training to recognize what is important.

It's hard to gauge what harm may have been done. The people who responded to this alert may be less inclined to do so the next time when a real tsunami threat is looming. I am appalled that US Embassy staff wouldn't first ask a few questions and call PTWC to get some expert advice. Bottom line - it illustrates our extreme vulnerability to social media, instant messaging and tweets in purveying misinformation in the 21st century. And the next time someone could get hurt.

Note: You can listen to my daily earthquake update at 707-826-6020 or online at

<https://www2.humboldt.edu/kamome/resources>. More on the El Salvador tweet that set off a tsunami evacuation at <https://ticotimes.net/2019/11/11/u-s-embassy-tweet-of-supposed-tsunami-causes-alarm-in-el-salvador-central-america>

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<https://www.times-standard.com/2019/11/14/lori-dengler-alerts-and-false-alarms-in-the-twitter-era/>